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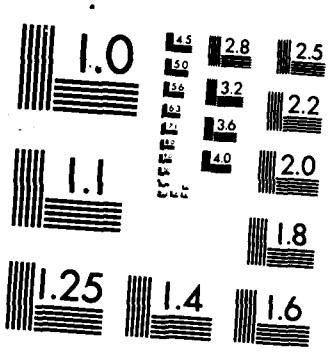

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Organizations As Information Processing Systems

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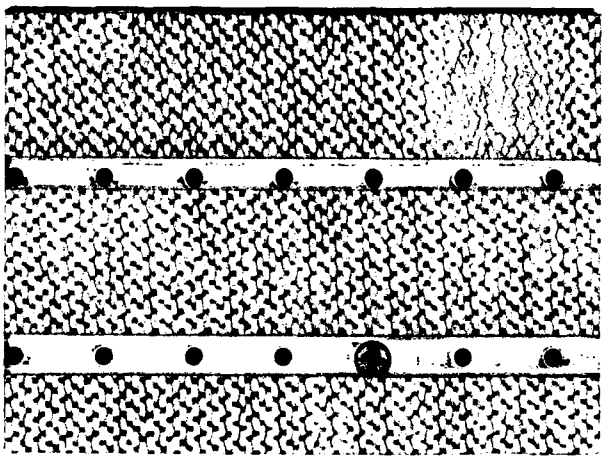

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Final Technical Report

Richard Daft
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October 1986

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This Final Technical Report describes the three year research effort on Organizations as Information Processing Systems. The paper is divided into three parts, overview of research program, annotated listing of technical reports, and other research outcomes that were generated.

The introduction presents a summary of the initial proposal including the three specific areas to be studied and what was planned to be done in each of these areas. This is followed by an annotated listing of all of the Technical Reports produced during the project. The conclusion summarizes what was actually learned in each of the three areas. Finally, the paper closes with a list of the articles that were published, presentations that were made and other research that was generated from this project.

OVERVIEW OF RESEARCH PROGRAM

The original proposal written in 1982 delineated four objectives for the research project. These included:

1. Develop and empirically evaluate a framework of the information processing behavior of managers;

2. Develop and empirically evaluate a framework of the role of information as a source of social influence for organizational leaders;

3. Develop and empirically evaluate a framework describing organizations as interpretation systems;

4. Suggest policy and practice implications for the more effective management of information processing systems in and between organizations.

The first three objectives tied directly to the three subprojects proposed as the major focus of the research: manager information processing behavior, information as social influence, and organizations as an interpretive system. The final objective was more global. In all three areas

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researched, suggestions about improving the management of information processing systems in and between organizations were to be made.

Our general conclusions about each of the research objectives are as follows.

Framework of Manager Information Processing Behavior

The research on this topic led to the development and empirical test of a framework of information processing by managers. The framework organized communication media into a hierarchy based on media richness. Face-to-face, telephone, written letters, and written reports are media that were studied, and each was found to have a unique capacity for conveying information. The framework proposed that face-to-face was the richest medium for resolving equivocal issues that confront managers, and that written media were appropriate for unequivocal, well defined communications. The empirical test generally supported these relationships as reported in TR-02, TR-08, TR-10, and TR-12.

Information as a Source for Social Influence

The research conducted in this area provided clear support for the role of information as a source of social influence. Information from a variety of sources and transmitted in a variety of ways was shown to systematically influence perceptions, attitudes, and behaviors. Since most of the information sources are under the leader's control (i.e., social cues, as shown by TR-03 and TR-09; group composition, as shown by TR-05; media for transmission, as shown by TR-07), it follows that the leader can use information in a viable way in the exercise of social influence.

Organizations as Interpretive Systems

The research conducted in this area was theoretical and exploratory. The theoretical framework was developed in TR-04 and elaborated in TR-10 and TR-18. These frameworks show how the relationship between organization and environment is mediated by the organization's interpretation of the environment. Interpretation styles were defined, and preliminary research was undertaken as reported in TR-20.

Suggested Policy and Practice Implications

Policy and practice implementations were developed by examining managerial information processing behavior and comparing it to manager performance. The second stage was to examine organizational interpretation behavior, and relate it to performance. The clear implication of these findings, as reported in TR-20 and TR-21 is that both manager and organizational performance is related to information processing behavior. For individual managers, high performers selected media to fit the message. In high performing organizations, senior executives scanned the environment broadly, and used a variety of qualitative and quantitative sources to form their interpretation. In TR-18, further policy implications of information systems design were explored.

The next section lists each of the Technical Reports that were generated from this project along with a brief synopsis of each. This section is followed by a list of other research publications that were produced from this project.

ANNOTATED LISTING OF TECHNICAL REPORTS

TR-ONR-DG-01 Thomas, J. and Griffin, R. The Social Information Processing Model of Task Design: A Review of the Literature. February, 1983.

This paper reviews ten studies dealing with the effects of social and information cues in the workplace on employee task perceptions, evaluations, and reactions. The review employs both judgmental and meta-analytic approaches to interpreting the findings. The two basic conclusions of the review are that social and information cues have been shown to consistently influence perceptions and affect, but that the area needs additional theoretical articulation and integration. Unanswered questions and suggestions for future research are identified.

TR-ONR-DG-02 Daft, R. and Lengel, R. Information Richness: A New Approach to Managerial Behavior and Organizational Design. May, 1983.

This paper introduces the concept of information richness, and proposes three models of information processing. The models describe (1) manager information behavior, (2) organizational mechanisms for coping with equivocality from the environment, and (3) organizational mechanisms for internal coordination. Concepts developed by Weick (1979) and Galbraith (1973) are integrated into two information tasks: equivocality reduction and the processing of a sufficient amount of information. The premise of this paper is that the accomplishment of these information tasks and the ultimate success of the organization are related to the balance of information richness used in the organization.

TR-ONR-DG-03 Griffin, R., Bateman, T. and Skivington, J. Social Cues as Informational Sources: Extensions and Refinements. September, 1983.

Recent laboratory studies supporting the SIP model of task design have been

subjected to a number of methodological criticisms. To put the model to a more thorough test, a laboratory study employing a relatively realistic 2x2x2 design was conducted. One factor was task design (enriched or unenriched), another was social cues from a confederate co-worker (positive or negative), and the third was social cues from a confederate supervisor (positive or negative). While manipulation checks clearly supported the validity of the design, few significant relationships were found. Two follow-up studies designed to test the effects of cue frequency were then conducted. Again, few significant results were obtained. Patterns of findings across all published SIP laboratory studies are then assimilated and discussed. Finally, implications for future theoretical and empirical research are explored.

TR-ONR-DG-04 Daft, R. and Weick, K. Toward a Model of Organizations as Interpretation Systems. September, 1983.

A comparative model of organizations as interpretation systems is proposed. The model describes four interpretation modes: enacting, discovering, undirected viewing, and conditioned viewing. Each mode is determined by (1) management's beliefs about the environment and (2) organizational intrusiveness. Interpretation modes are hypothesized to be associated with organizational differences in environmental scanning, equivocality reduction, strategy, and decision making.

TR-ONR-DG-05 Bateman, T., Griffin, R. and Rubinstein, D. Social Information Processing and Group-Induced Response Shifts. January, 1984.

A repeated measures control group experiment, designed in the group polarization tradition, revealed significant shifts in responses to tasks after group discussion. A process incorporating converging perspectives on task design--whereby employees form initial reactions to tasks, process

incoming social information, and adjust their perceptions accordingly--is suggested.

TR-ONR-DG-06 Daft, R. and Macintosh, N. The Nature and Use of Formal Control Systems for Management Control and Strategy Implementation. February, 1984.

Management control research from organization theory, accounting and business policy is reviewed, and a two-stage qualitative study of management control systems (MCS's) is reported. The study identified four MCS components--budget, policies and procedures, performance appraisal system, and statistical reports--that were used at the middle management level in business organizations. Each MCS component played a role during the control cycle of target setting, monitoring, and corrective feedback. The findings were used to propose two models--one model links the MCS to business-level strategy implementation, and the other model defines primary and secondary roles for MCS components in the management control process.

TR-ONR-DG-07 Head, T., Griffin, R. and Bateman, T. Media Selection for the Delivery of Good and Bad News: A Laboratory Experiment. May, 1984.

This study investigated the extent to which managers choose different media to convey good versus bad news. A sample of undergraduate students role-played a middle manager's position in a large organization. Each was asked to relay several pieces of good and bad news to his or her subordinates. Results indicated that the managers used face-to-face communication to deliver bad news significantly more often than they used either the telephone or a written memo.

TR-ONR-DG-08 Lengel, R. and Daft, R. An Exploratory Analysis of the Relationship Between Media Richness and Managerial Information Processing. June, 1984.

A dilemma exists between technical information designers and students of

managerial information behavior. A richness model is proposed that uses the concepts of media richness and communication learning requirements to integrate the two perspectives. The concepts and model were tested in a four-stage research program, and they were generally supported. Managers tended to prefer rich, oral media when learning requirements were high and less rich, written media when learning requirements were low.

TR-ONR-DG-09 Griffin, R., Bateman, T., Wayne, S. and Head, T. Objective and Social Factors as Determinants of Task Perceptions and Responses: An Integrative Framework and Empirical Investigation. November, 1984.

The purpose of this study was to test the relative efficacy of the task attributes model of task design, the social information processing model of task design, and an integrated framework derived from the two. A complex laboratory study manipulating objective task properties, social information, and changes in both objective task properties and social information was conducted to test the three models. Results suggested moderate support for the social information processing model, strong support for the task attributes model, and the strongest support for the integrated framework. Implications for future theory and research are discussed.

TR-ONR-DG-10 Daft, R. and Lengel, R. A Proposed Integration Among Organizational Information Requirements, Media Richness and Structural Design. November, 1984.

This paper argues that information processing in organizations is influenced by two forces--equivocality and uncertainty. Equivocality is reduced through the use of rich media and the enactment of a shared interpretation among managers (Weick). Uncertainty is reduced by acquiring and processing additional data (Galbraith; Tushman and Nadler). Elements of organization structure vary in their capacity to reduce equivocality versus uncertainty. Models are proposed that link structural characteristics to the level of

equivocality and uncertainty that arise from organizational technology, interdepartmental relationships, and the environment.

TR-ONR-DG-11 Giroux, G., Mayper, A. and Daft, R. Toward a Strategic Contingencies Model of Budget Related Influence in Municipal Government Organizations. November, 1984.

This paper explores the relationship between budgeting and perceived power in city government organizations. Data are reported from a survey of perceived budget influence in six city governments in Texas. During budget formulation city managers were perceived as having the most vertical power, followed by the city council, department heads, and department employees. During budget implementation, there was a perceived increase in department head vertical power and a decrease in city council power. Perceptions of horizontal power suggested that budget departments generally had greater perceived influence than operating departments for budget related issues. The findings are used to develop a strategic contingencies model of budget-related power, and to suggest some research steps for testing the proposed model.

TR-ONR-DG-12 Macintosh, N. and Daft, R. Technology, Personal Attributes and the Perceived Amount and Focus of Accounting and Information System Data. March, 1985.

Characteristics of cognitive style and managerial tasks are related to the way managers perceive and use formal accounting and information system data. Data were collected from 142 respondents in 24 departments of several organizations. The findings suggest that when tasks are well defined, managers preferred a large amount of formal accounting information system data. For ill-structured tasks, respondents tended to prefer multiple focus information that required greater interpretation. The tasks of information users showed a more consistent relationship with information preference than did the cognitive style of users.

TR-ONR-DG-13 Macintosh, N. and Daft, R. Management Control Systems and Interdependencies: An Empirical Study. March, 1985.

Two themes in behavioral accounting research suggest that management accounting system characteristics are related to characteristics of the larger organization and that the management accounting system is one element in a control system package. The research reported here investigates the relationship between departmental interdependencies and the design and use of three management control systems--the operating budget, periodic statistical reports, and standard operating policies and procedures. The findings support the idea that interdependency between departments influences the emphasis placed on specific management control systems. Standard operating procedures are an important control device when interdependence is moderate. When interdependence between departments is high, the role of all three control systems diminish. The findings support the themes that accounting based systems are one device in the organizational control package and that control systems are employed differently according to organizational characteristics.

TR-ONR-DG-14 Head, T., Yates, V. and Bateman, T. The Primary Effect in Task Design Research. April, 1985.

This study, using a diffferent operationalization from previous work, investigated the potential impact of the priming effect on task design research. The priming effect, as discussed by Salancik and Pfeffer (1977, 1978), is artificially increasing an attitude's saliency including items describing that attitude on a questionnaire. Results of the study demonstrated a strong presence of priming effects. Further analyses of how the priming effect may manifest itself in common descriptive statistics (means, correlations, reliabilities) provided mixed findings.

TR-ONR-DG-15 Griffin, R. and Bateman, T. Job Satisfaction and Organizational Commitment. May, 1985.

This paper presents the development of a Symbolic International Leadership model. The model integrates three emergent streams of thought, symbolic action, reciprocal interactions, and interactional psychology, into a fresh approach which offers considerable advancement over simple, unidirectional, bivariate, static models. Implications for future theory and research are discussed.

TR-ONR-DG-16 Griffin, R. and Bateman, T. Job Satisfaction and Organizational Commitment. May, 1985.

The literature on job satisfaction and organizational commitment is reviewed. Job satisfaction is defined and current theoretical perspectives identified. Subsequent discussions focus on the measurement of satisfaction, methods of studying satisfaction, the determinants of satisfaction, and the consequences of satisfaction. A parallel treatment of organizational commitment follows. Finally, agendas for future theory and research are summarized.

TR-ONR-DG-17 Griffin, R. Toward an Integrated Theory of Task Design. April, 1986.

At present, the study of task design lacks a clear and demonstrable focus. The reasons for this condition relate to controversies and contradictions surrounding the dominant models and theories in the area. Yet, task design remains an important topic for scientific inquiry. In an effort to reestablish focus and direction, an integrated theory of task design is proposed. The theory is not viewed as an alternative for existing models, but instead as a natural extension of each. After a brief review of the literature, several emerging questions and issues about the current viewpoints are explicated and discussed. The integrated theory is then presented.

First, its major concepts are identified and defined. The boundaries of the theory are then delineated. System state dynamics are summarized and the nomological network among three central concepts of the theory is discussed. Each broad category of related variables is then introduced and appropriate interrelationships noted. The major elements of the theory are summarized as propositional statements. An overview of implications for future theory and research concludes the presentation.

TR-ONR-DG-18 Daft, R. and Huber, G. How Organizations Learn: A Communication Framework. April, 1986.

If organizational scientists could create and validate operational theories of how organizations learn, and if they could cause organizations to learn and effectuate these theories, then some of the wasted resources associated with organizational failures might be diminished. An early step is to assess where we stand in the development of operational theories of organizational learning. We make this assessment and propose a new model of organizational learning. Our goal is to define two perspectives on organizational learning and to contrast and connect them, and thereby to facilitate movement from metaphor making to theory building.

TR-ONR-DG-19 Daft, R., Griffin, R. and Yates, V. Toward a Model of the Research Factors Associated with Significant Research Outcomes. April, 1986.

Three models with the potential to explain significant organizational research outcomes were proposed and tested. Fifty-six organizational scholars were surveyed about one significant and one not-so-significant research project. The findings identified several reported factors that occurred prior to and during research projects that were related to research outcomes. The Ambidextrous model, which includes both organic and mechanistic research

Thomas, J. and Griffin, R. "The Social Information Processing Model of Task Design: A Review of the Literature." Paper presented at the Annual Meeting of the American Institute for Decision Science, San Francisco, 1982.

DISSERTATIONS:

Lengel, Robert H. Managerial Information Processing and Media Selection Behavior. Texas A&M University, 1983.

Skivington, James Edward. Implementation of Low Cost and Differentiation Strategies in Three Industries. Texas A&M University, 1985.

Giroux, G., Mayper, A. and Daft, R. "Toward a Strategic Contingencies Model of Budget Related Influence in Municipal Government Organizations." Accounting, Organizations and Society, in press.

Griffin, R. "Toward an Integrated Theory of Task Design." Chapter in Research and Organizational Behavior, L. L. Cummings and B. Staw (Eds.), Volume 9, in press.

Griffin, R. and Bateman, T. "Job Satisfaction and Organizational Commitment." Chapter in Review of Individual and Organizational Psychology, C. L. Cooper and I. T. Robertson (Eds.), John Wiley and Sons Publishing Company, 1986.

Griffin, R., Skivington, K. and Moorhead, G. "Symbolic and Interactional Perspectives on Leadership: An Integrated Framework." Human Relations, in press.

Huber, G. and Daft, R. "The Information Environments of Organizations." Chapter in Handbook of Organizational Communication, Linda Putnam, et al. (Eds.), Sage, 1986.

Macintosh, N. and Daft, R. "Departmental Interdependence and Management Control Systems Design." Accounting, Organizations and Society, in press.

Thomas, J. and Griffin, R. "The Social Information Processing Model of Task Design: A Review of the Literature." Academy of Management Review, 1983.

Weick, K. and Daft, R. "The Effectiveness of Interpretation Systems." Chapter in Organizational Effectiveness: A Comparison of Multiple Models, Kim Cameron and David Whetten (Eds.), Academic Press, 1983.

PRESENTATIONS:

Daft, R., Griffin, R. and Yates, V. "Toward a Model of the Research Factors Associated with Significant Research Outcomes." Paper presented at the 45th Annual Meeting of the Academy of Management, San Diego, 1985.

Griffin, R., Bateman, T. and Skivington, J. "Social Cues as Informational Sources: Extensions and Refinements." Paper presented at the Annual Meeting of the American Institute for Decision Science, San Antonio, 1983.

Griffin, R., Bateman, T., Wayne, S. and Head, T. "Objective and Social Factors as Determinants of Task Perceptions and Responses: An Integrative Framework and Empirical Investigation." Paper presented at the 45th Annual Meeting of the Academy of Management, San Diego, 1985.

Head, T., Griffin, R. and Bateman, T. "Media Selection for the Delivery of Good and Bad News: A Laboratory Experiment." Paper presented at the 44th Annual Meeting of the Academy of Management, Boston, 1984.

Head, T., Yates, V., Griffin, R. and Bateman, T. "The Primary Effect in Task Design Research." Paper presented at the Annual Meeting of the Southern Management Association, Orlando, 1985.

TR-ONR-DG-22 Daft, R., Lengel, R. and Trevino, L. The Relationship Among Message Equivocality, Media Selection, and Manager Performance: Implications for Information Support Systems. September, 1986.

A field study of 95 middle-level and upper-level managers was undertaken to explain top managers' selection of communication media. The findings indicate that media vary in their capacity to convey information cues, and that media "richness" is correlated with message equivocality. Managers prefer rich media for equivocal communications and less rich media for unequivocal communications. The data suggest that high performing managers are more sensitive to the relationship between message equivocality and media richness than low performing managers. Implications for managers' use of information systems and electronic media are discussed.

OTHER RESEARCH OUTCOMES

PUBLICATIONS:

Bateman, T., Griffin, R. and Rubinstein, D. "Social Information Processing in Group Induced Shifts in Response to Task Design." Group and Organizational Studies, in press.

Daft, R. and Huber, G. "How Organizations Learn: A Communication Framework." Chapter in Research in the Sociology of Organizations, Volume 5, Samuel Bacharach and Nancy DiTomaso (Eds.), JAI Press, in press.

Daft, R. and Lengel, R. "Information Richness: A New Approach to Manager Information Processing and Organizational Design." Chapter in Research in Organizational Behavior, Volume 6, Barry Staw and L. L. Cummings (Eds.), JAI Press, 1984.

Daft, R. and Lengel, R. "Organizational Information Requirements, Media Richness and Structural Design." Management Science, 32 (1985): 554-571.

Daft, R. and Macintosh, N. "The Nature and Use of Formal Control Systems for Management Control and Strategy Implementation." Journal of Management, 10 (1984): 43-66.

Daft, R. and Weick, K. "Toward a Model of Organizations as Interpretive Systems." Academy of Management Review, 9 (1983): 284-295.

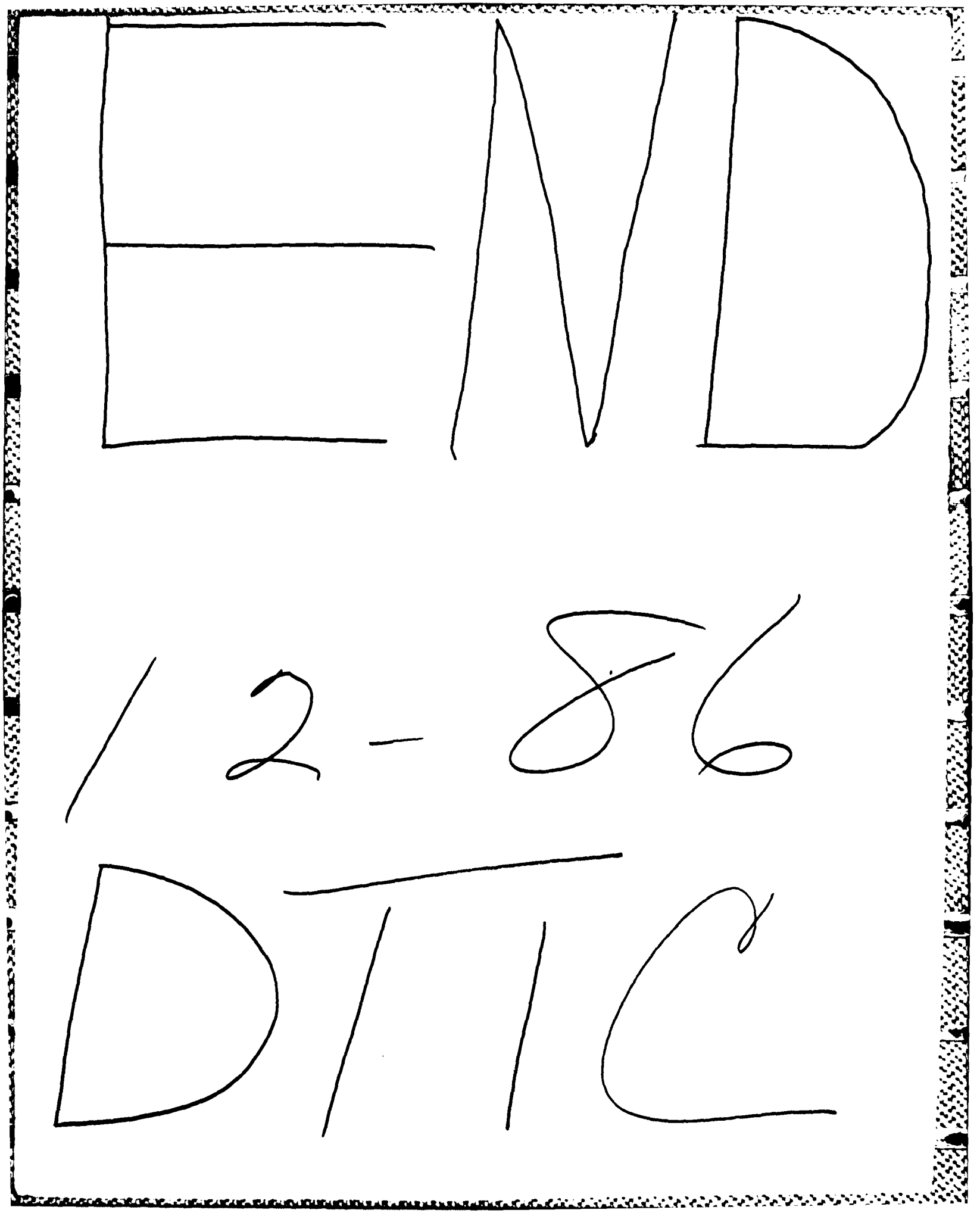
characteristics, differentiated significant from not-so-significant research better than the Davis and Antecedents models.

TR-ONR-DG-20 Daft, R., Sormunen, J. and Parks, D. Environmental Characteristics, Company Performance, and Chief Executive Scanning: An Empirical Study. April, 1986.

Chief executives in fifty manufacturing companies were interviewed about the perceived strategic uncertainty in six environmental sectors, and the frequency and mode of scanning used for each sector. The findings suggest customer, economic, and competitor sectors generated greater strategic uncertainty than technological, regulatory, and socio-cultural sectors. When sector uncertainty was high, executives reported greater frequency of scanning and greater use of personal information sources. Chief executives in high performing companies scanned more frequently and more broadly in response to strategic uncertainty than their counterparts in low performing companies.

TR-ONR-DG-21 Skivington, J. and Daft, R. A Study of Organizational "Framework" and "Process" Modalities for the Implementation of Business-Level Strategies. September, 1986.

Based on structuration theory, organization framework and process are proposed as two modalities for implementing intended business-level strategies. A model is developed in which the components of these two modalities are defined and related to the implementation of low cost and differentiation strategies. The implementation of fifty-seven strategies in integrated circuits, petroleum, and health care firms are used to test the research hypotheses. The findings suggest that strategy implementation in these firms utilized both framework and process structural elements, but that a different implementation gestalt characterized each strategy. Implications for strategy implementation and for structuration theory are discussed.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